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Sadiria kachinensis (Myrsinoideae, Primulaceae), a new species from Myanmar

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Abstract

Sadiria kachinensis from Kachin State, Myanmar is described and illustrated as a species new to science. It is morphologically similar to *S. boweri* and *S. solanifolia* but differs in several characters especially the smaller leaves on the vegetative shoots and the flowering branches, larger inflorescences and petals, and smaller sepals. In addition, this new species is compared to *S. eugeniifolia* var. *burmanica*, the only other member of *Sadiria* in Myanmar.

Key words: Burma, Ericales, Indo-China, South-East Asia, taxonomy

Introduction

The Primulaceae is a cosmopolitan family well known for the cultivated, temperate taxa including especially *Primula* Linnaeus (1753: 142), *Cyclamen* Linnaeus (1753: 145) and *Lysimachia* Linnaeus (1753: 146), but includes significant species diversity in the tropics in subfamilies Maesoideae, Myrsinoideae and Theophrastoideae (Larson *et al*. 2023); of these, Maesoideae is monotypic (Sumanon *et al*. 2023), while Theophrastoideae is restricted to the New World. Within the Myrsinoideae, previously treated as part of the Myrsinaceae (e.g., Mez 1902), two major informal groups have been resolved in the most recent phylogenetic study: 'Ardisioids' and 'Myrsinoids' (Larson *et al*. 2023), with *Ardisia* Swartz (1788: 48) the most species-rich group (but not recovered as monophyletic by Larson *et al*. 2023). *Ardisia* is a pantropical genus with approximately 740 species and is one of the understudied megadiverse understorey tropical plant groups (Frodin 2004; Utteridge *et al*. 2023; POWO 2025).

In addition to *Ardisia*, numerous segregate genera are recognised within the 'Ardisioids' including the genus *Sadiria* Mez (1902: 181) from the eastern Indian Subcontinent, Indo-China and China—with the name an anagram of *Ardisia* ("nomen permutatione Ardisiae formatum"). *Sadiria* is distinguished by the tubular corolla (fused above the middle), and the very short, axillary, subfasciculate cymose or subpaniculate inflorescences that arise on specialized lateral branches (Mez 1902; Hu & Deng 2012). To date, nine species and two varieties of *Sadiria* have been described, ranging from the eastern Himalayas to southwest China (Mez 1902; Kurz 1974; Nayar & Giri 1974; Giri *et al*. 1992; Ståhl & Anderberg 2004; Hu & Deng 2012; Wang *et al*. 2018). The Flora of China treatment (Chen & Pipoly 1996) did not recognise *Sadiria*, but enumerated *Ardisia aberrans* (E.Walker) C.T.Wu & Chen (1977: 337) from Yunnan, which was subsequently transferred to *Sadiria aberrans* (E.Walker) C.M.Hu & Y.F.Deng (2012: 396). (This species was originally described as *Embelia aberrans* E.Walker (1939: 173), hence the epithet.)

During the naming and identification of newly collected Primulaceae specimens from Myanmar by the first author held in the herbarium at the National Museum of Nature and Science, Japan (acronym TNS) two species of *Sadiria* were included. Whilst these were distributed with field determinations as *Maesa* Forsskål (1775: 66), *Embelia* Burman (1768: 62) and *Ardisia*, the fused corolla, and short inflorescences in axils of leaves on plagiotropic branches place them as members of *Sadiria*.

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Of the material in TNS, the most collected taxon had comparatively long reproductive branches with up to 10 or more leaves, usually drying a chocolate-brown, and was identified as *Sadiria eugeniifolia* (Wall. ex A.DC.) Mez (1902: 182) var. *burmanica* M.P.Nayar & G.S.Giri (1974). Kress *et al*. (2003) recorded *S. eugeniifolia* as the only species of *Sadiria* from Myanmar, but subsequently, Aung *et al*. (2025) listed three species of *Sadiria* from Myanmar: *S. aberrans* (as *A. aberrans*), *S. eugeniifolia* and *S. griffithii* (C.B.Clarke) Mez (1902: 183). The types of all these taxa are very similar and have relatively long plagiotropic branches with leaves drying a dark brown; unfortunately, they are all poorly known and may be conspecific.

The remaining material had much shorter plagiotropic branches with only up to four leaves which dry green, and when compared with other members of *Sadiria*, more closely resembled *Sadiria boweri* Dunn (1920: 111) and *S. solanifolia* Mez (1902: 182), in the drying colour of the leaves, leaf size and shape. After further comparison with the types and protologues of *Sadiria,* and any other related taxonomic literature, we confirmed that it represents an undescribed species of *Sadiria*, which is formally published and illustrated here.

Materials and methods

The new species was based on examination of the available materials in the field and herbarium. The comparison with morphologically similar species was based on examination of specimens in herbaria using physical and online resources at the following institutions: A, CAL, E, K, L, NY, P, SING, TNS and US. Protologues and descriptions in relevant literature were also examined (Candolle 1834; Clarke 1882; Mez 1902; Dunn 1920; Nayar & Giri 1974; Chen 1977 1979; Giri *et al.* 1992; Chen & Pipoly 1996; Hu & Deng 2012; Wang, L.Y. *et al*. 2018; Wang, Z.H. *et al.* 2019).

Taxonomic treatment

Sadiria kachinensis Utteridge & Nob.Tanaka, *sp. nov.* (Fig. 1)

Recognised in the genus *Sadiria* by the leaves (ortho- and plagiotropic) drying greenish and the shorter plagiotropic reproductive branches, and unique amongst those species in the combination of the following characters: 3–4 leaves in pseudowhorls along the erect (orthotropic) stems, these orthotropic leaves, elliptic and 9.5–13 × 3.5–4.5 cm; the lateral plagiotropic (reproductive) flower-bearing branches (4–)6.5–11 cm long, with 3(–5) leaves along the length of the branch; orthotropic and reproductive shoots leaves drying green; pendulous inflorescences sessile or with a very short rachis to 2 mm long; the corolla fused for approximately three-quarters of its length; stamens with anthers 2 mm long; and the style conspicuously exserted at anthesis and extending ca. 3 mm beyond the apex of the corolla lobes.

Type:—MYANMAR. Kachin State: Putao District, Hponganrazi Wildlife Sanctuary, between Hponyinrazi camp 1 and camp 2, 27°36’33.6”N, 96°58’51.3”E, elev. ca. 2252 m, 30 Apr. 2018, *Armstrong et al. 4307* (holotype TNS [TNS01341946]; isotypes E, K [K001927996], NY [NY04290161], RAF).

‘Treelet 50 cm tall’. Branchlets angulate, ca. 1 mm in diam., young vegetative parts densely rusty-brown hairy with short club-shaped or branched hairs and scales, remaining puberulent and sparsely scaly at maturity (see description of individual parts). Leaves on orthotropic (vegetative) stems spirally arranged in pseudo-verticils of 3–4 at ca. 8 cm apart with plagiotropic (reproductive) branches arising in the axils or defoliate axils, chartaceous to subcoriaceous, lamina elliptic, 9.5–13 × 3.5–4.5 cm, base cuneate, apex attenuate to caudate, drying a dull olive-green on both surfaces, glabrous adaxially, hairy to sparsely hairy and sparsely scaly abaxially, densely dark brown raised punctate on both sides, margin minutely crenulate where the secondary vein branch reaches the midrib; secondary veins 14–16 pairs, slightly sunk adaxially and raised abaxially, semicraspedodromus, tertiary veins weakly percurrent, midrib and venation shortly hairy adaxially, hairy to densely hairy and scaly abaxially; petiole 8–12 mm long, densely rusty hairy and scaly. Lateral plagiotropic (reproductive) branches (4–)6.5–11 cm long, with 3(–5) leaves along the length of the branch, the proximal/first leaf usually greatly reduced in size or absent, distal leaves chartaceous to subcoriaceous, lamina elliptic, 8.5–11.5 × 3.5–4.5 cm, base cuneate, apex attenuate to caudate, indumentum and punctations as orthotropic leaves, margin minutely crenulate where the secondary vein branch reaches the midrib; secondary veins 10–14 pairs, slightly sunk adaxially and raised abaxially, semicraspedodromus, tertiary veins weakly percurrent, indumentum

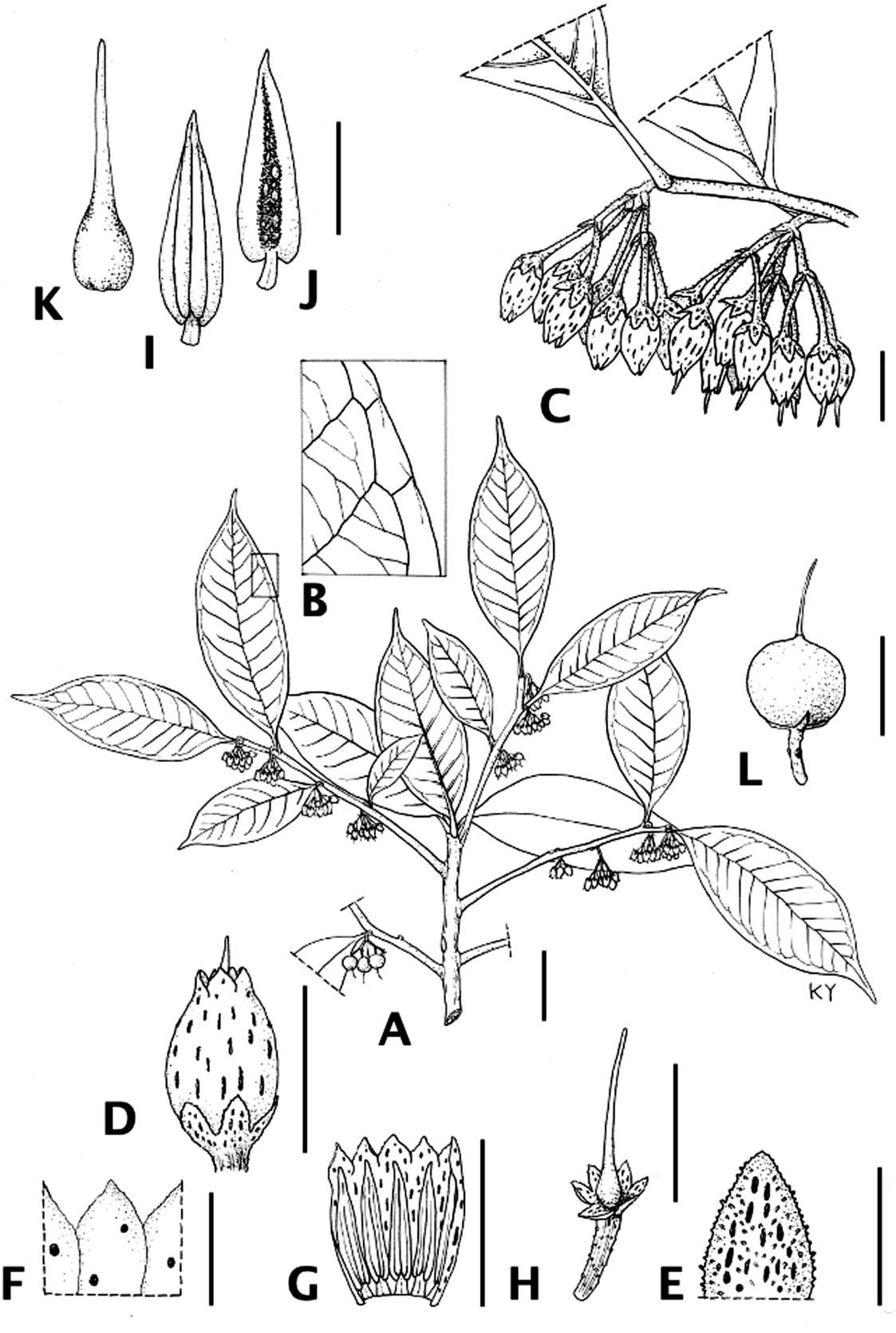

FIGURE 1. *Sadiria kachinensis* Utteridge & Nob.Tanaka. **A** habit; **B** detail of leaf margin; **C** inflorescences; **D** flower; **E** single calyx lobe; **F** detail of overlapping corolla lobes; **G** flower opened to show stamens opposite the corolla lobes; **H** ovary and style (flower with corolla removed); **I** stamen abaxial view; **J** stamen adaxial view; **K** ovary; **L** fruit with persistent style. Drawn from *Armstrong et al. 4307* (TNS). Scale bars: A = 3 cm, C, D, G, H, L = 5 mm, E & F = 1 mm, I, J & K = 3 mm. Illustration by Kaoru Yoneda.

as for orthotropic leaves; petiole 5–6 mm long, densely rusty hairy and scaly. Inflorescences pendulous in axils of reproductive shoot leaves or from defoliate axils, (1–)3(–4) inflorescences per plagiotropic (reproductive) branch, sessile or with a short rachis 1–2 mm long, 1(–2) central flower with 3 first order branches bearing 3 flowers and appearing corymbose, rachis and branches densely rusty-brown hairy; pedicels 3.5–5 mm long, densely rusty-brown hairy. Flowers 5-merous, 'buds bright pink' (*fide* Armstrong *et al.* 4032); sepals narrowly triangular, 1–1.5 mm long, densely rusty-brown hairy, orange punctate, margin ciliate, apex acute; corolla (including lobes) 4.5–5.5 mm long, corolla fused for approximately three-quarters of its length, tube 3.5–4 mm long, orange punctate or linear-punctate; corolla lobes triangular, 1.5–1.75 mm long, overlapping at the edges, margin entire, apex acute; stamens: filaments ca. 1 mm long, anthers 2 mm long, apical connective apiculate, 1 mm long, dorsal anther cells with basal pendulous ligulate appendage 0.5 mm long; ovary globose, glabrous, ca. 1 mm long, tapering into the style; style 7–8 mm long at anthesis and extending ca. 3 mm beyond the apex of the corolla lobes, glabrous; stigma punctiform. Fruit globose, 5–6 mm in diam., 'fruit red' (*fide* Armstrong *et al*. 4307).

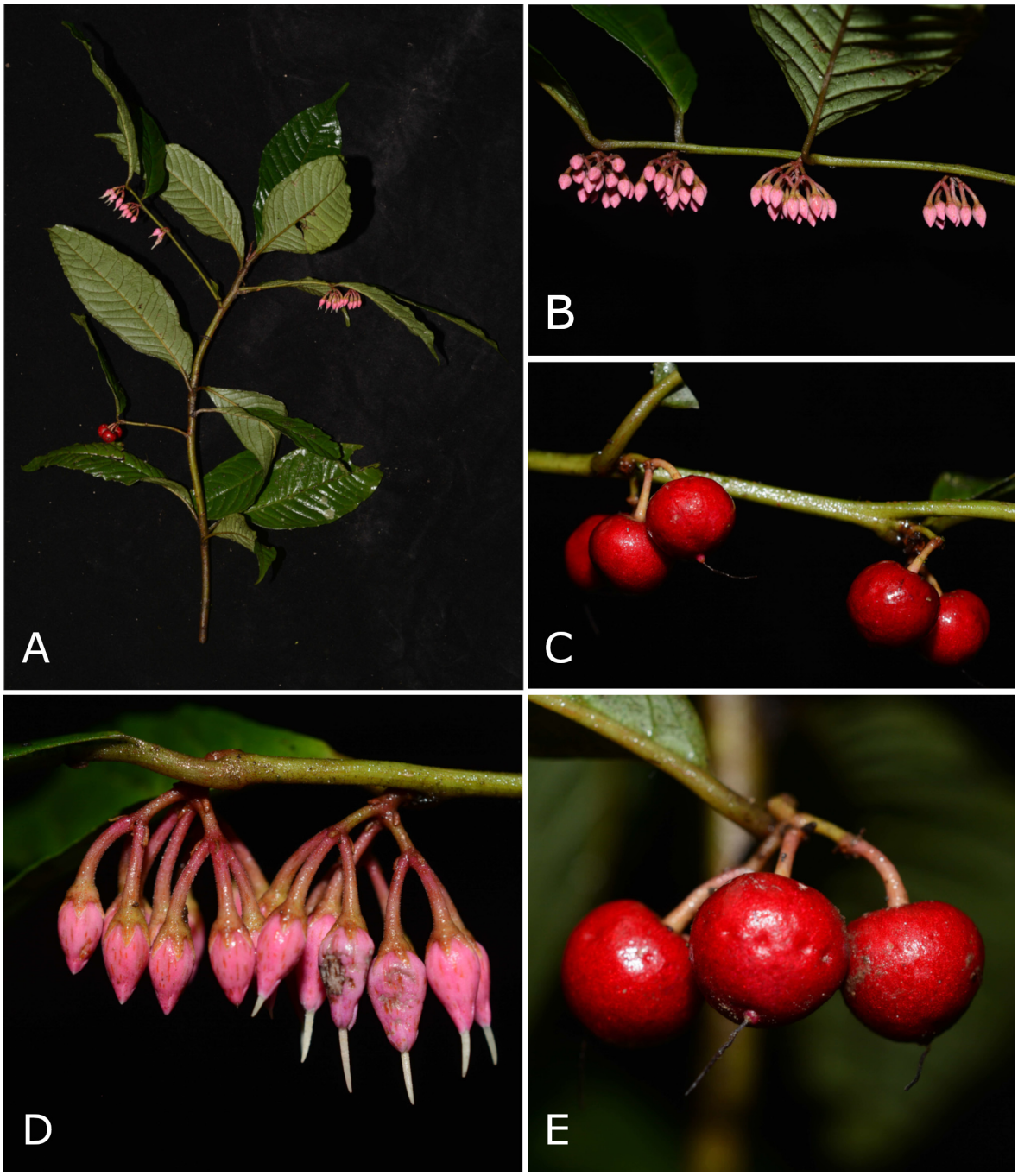

FIGURE X. *Sadiria kachinensis* Utteridge & Nob.Tanaka. **A.** habit; **B.** plagiotropic (flowering) branch with inflorescences and flowers pre-anthesis; **C.** plagiotropic branch with fruits; **D.** inflorescence/flower detail, note exserted styles in the flowers on the right hand side; **E.** fruit detail, note persistent style (dry and black). Photographed by Kate Armstrong.

Distribution and Habitat:—Myanmar, currently only known from Kachin State. It has been recorded growing in primary forest at an elevation of 2252–2282 m.

Phenology:—Recorded with flowers in April and October, and with fruits in April.

Etymology:—Named for Kachin State in Myanmar.

Additional specimens examined:—MYANMAR. Kachin State: Putao District, Hponganrazi Wildlife Sanctuary, above Upper Thit Pin Gyi, 27°32'3.2"N, 96°59'33.6"E, elev. 2282 m, 26 Oct. 2016, *Armstrong et al. 2079* (E, NY [NY02653386]; RAF); ibid., between Hponyinrazi camp 1 and camp 2, 27°36'33.6"N, 96°58'51.3"E, elev. ca. 2252 m, 30 Apr. 2018, *Armstrong et al. 4023* (E, K [K001927984], TNS [TNS01341954]; NY [NY04299139]; RAF).

Discussion:—The two specimens from Kachin State are undoubtedly a member of the genus *Sadiria*, because of the fused corolla (rather than the almost free lobes of *Ardisia*), as well as the 'treelet' habit together with the architecture: orthotropic stems with spirally arranged leaves and plagiotropic branches bearing inflorescences borne in the axils of distichous leaves.

In Myanmar, the two *Sadiria* species differ significantly in their morphology. *Sadiria eugeniifolia* var. *burmanica* has much longer plagiotropic reproductive shoots bearing several to many leaves (e.g., branch c. 70 cm long with up to 17 leaves seen in *Armstrong et al.* 1421 [TNS01348097!]). The species described here has much shorter plagiotropic reproductive shoots with only up to 5 leaves that dry green. In comparison to other species characterised by shorter plagiotropic shoots and green-drying leaves, *S. kachinensis* exhibits reproductive leaves that are comparable in size and morphology to those of *S. boweri* and *S. solanifolia* (clarification regarding the status of the latter name is provided below).

Sadiria kachinensis has very similar sized reproductive shoot leaves to *S. boweri*, but that species differs in being glabrous, having 11–13 secondary vein pairs with the secondary veins usually reaching the shallowly crenate margin and only sometimes forming strong secondary arches, and the much smaller flowers (*S. boweri* corolla length: 2.3–2.9 mm long; *S. kachinensis* 4.5–5.5 mm long). *Sadiria boweri* is currently known from Assam. *Sadiria solanifolia*, from Bhutan, has similar length and shape orthotropic leaves as the new species described here, but these are wider (*S. solanifolia*: 5.5–5.9 cm v. *S. kachinensis*: 3.5–4.5 cm) and with longer petioles (*S. solanifolia*: 12.1–15.9 mm v. *S. kachinensis*: 8–12 mm). The flowers are borne on much longer pedicels (*S. solanifolia*: 4.9–7.5 mm v. *S. kachinensis*: 3.5–5 mm). Further differences between these three taxa are listed in Table 1.

TABLE 1. Morphological comparison between *Sadiria boweri*, *S. kachinensis* and *S. solanifolia*.

	S. boweri	***S. kachinensis***	***S. solanifolia***
Orthotropic leaf shape	elliptic-obovate	elliptic	elliptic
Ortho. leaf length	12–15 cm	9.5–13 cm	11.5–13.7 cm
Ortho. leaf width	5.7–8 cm	3.5–4.5 cm	5.5–5.9 cm
Orth. leaf margin	shallowly, irregular serrulate	minutely crenulate	irregular serrulate
Ortho. leaf petiole length	17–25 mm	8–12 mm	12.1–15.9 mm
No of leaves on plagiotropic branches	5	3(–5)	4
Plagio. leaf length	8.5–11.2 cm	8.5–11.5 cm	10–12 cm
Plagio. leaf width	4.0–4.5 cm	3.5–4.5 cm	4.9–5.7 cm
Corolla length	2.3–2.9 mm	4.5–5.5 mm	5–6 mm
Pedicel length	3.1–3.3 mm	3.5–5 mm	4.9–7.5 mm

Sadiria solanifolia is accepted here despite having been previously placed as synonym of *Amblyanthopsis membranacea* (Wall. ex A.DC.) Mez (1902: 211). *Sadiria* has crenulate or entire margins, where the tooth is formed from a branch from the secondary arch. In *Amblyanthopsis* Mez (1902: 210), the 'teeth' are not teeth, but rather glandular type nodules at regular intervals giving the margin a crenulate appearance which is very similar to species in *Ardisia* §*Crispardisia* Mez (1902: 74). In addition, *Sadiria*, including the type of *S. solanifolia* which shows it very well, has specialised reproductive branches with almost sessile inflorescences in the axils of the 'leaves' (which may just be leaf-like bracts). In *A. membranacea*, the inflorescences are in the axils of spirally arranged leaves on the main vertical axis, with the inflorescences somewhat corymbose on a comparatively long pendulous peduncle.

Amblyanthopsis is close to *Ardisia* §*Crispardisia* in the nodules or *Ardisia* §*Tinus* Mez (1902: 70) in the inflorescence position and structure. But the type of *Sadiria solanifolia*, and all other species of *Sadiria*, have absolutely nothing in similar with *Amblyanthopsis*. Generic delimitation in Ardisioids needs careful consideration of the plant's architecture, vegetative morphology and inflorescence structure—basing generic decisions solely on floral structure, in this case both *Sadiria* and *Amblyanthopsis* have connate petals, can result in erroneous generic delimitation (see the example of the resolution of New World 'Hymenandra' in Larson *et al*. 2023).

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